

CHAPTER 1

THE ROLE OF ANTIARMOR ORGANIZATIONS

Antiarmor companies and platoons can fight and win engagements within the full spectrum of operations (offense, defense, stability, and support). The antiarmor company is normally task organized by the airborne/air assault infantry battalion commander or the Stryker brigade combat team (SBCT) commander, based on his estimate of the situation, to perform a variety of tactical missions as part of battalion or SBCT operations. The light infantry battalion commander task organizes his antiarmor platoon in much the same manner. In filling this combat role, the antiarmor unit integrates with combat, combat support (CS), and combat service support (CSS) elements. The company and platoons are capable of deploying as part of the Army's force projection requirements. This chapter addresses antiarmor doctrine, organization, fundamentals, and capabilities and limitations.

1-1. ANTIARMOR DOCTRINE

Antiarmor systems operate on the battlefield with infantry, armor, and other elements of the combined-arms team as well as with the SBCT. Long-range antiarmor fires are important to destroying the integrity of the enemy's combined-arms team. US tactical doctrine prefers to use a base-of-fire force or a fixing force along with a maneuver force. A commander's situational understanding (SU) will allow units to effectively find and fix the enemy force while maintaining sufficient combat power for decisive maneuver and sufficient depth to reduce the risk and exploit success. Mass and depth are the keys to employing antiarmor assets. When terrain and fields of fire allow, an antiarmor commander (or platoon leader) should control antiarmor subordinate units, planning and directing antiarmor fires in accordance with the higher commander's scheme of maneuver. During tactical operations, antiarmor units suppress, fix, or destroy enemy at long ranges, allowing infantry forces to maneuver. Commanders should task organize and employ antiarmor units based on an analysis of the factors of mission, enemy, terrain, troops and support available, time available, and civil considerations (METT-TC).

1-2. ORGANIZATION AND CHARACTERISTICS

The armor and motorized threat of potential enemies has led to organizing light, airborne, and air assault battalions, and the SBCTs, with antiarmor units. Although they may differ in their organization and equipment, they all have the tube-launched, optically tracked, wire-guided (TOW) weapon system as a centerpiece. In the light, airborne, and air assault battalions, each antiarmor platoon has two sections, and each section has two vehicles. The SBCT antiarmor company consists of three platoons with three TOW-equipped antiarmor interim armored vehicles (ICVs) in each platoon. Table 1-1, page 1-2, depicts the table of organization and equipment (TOE) for antiarmor units.

SIZE ALLOCATED	TYPE OF TOE
Antiarmor Company (5 Platoons)	Infantry (air assault and airborne) battalions
Antiarmor Company (3 Platoons)	Stryker brigade combat team
Antiarmor Platoon	Light infantry battalion

Table 1-1. Antiarmor organization options.

a. **Antiarmor Company in the Airborne and Air Assault Battalion.** Each infantry battalion in the airborne or air assault division has an *assigned antiarmor company* (Figure 1-1). The antiarmor company commander is responsible for advising the battalion commander on the tactical employment of the company and its platoons.

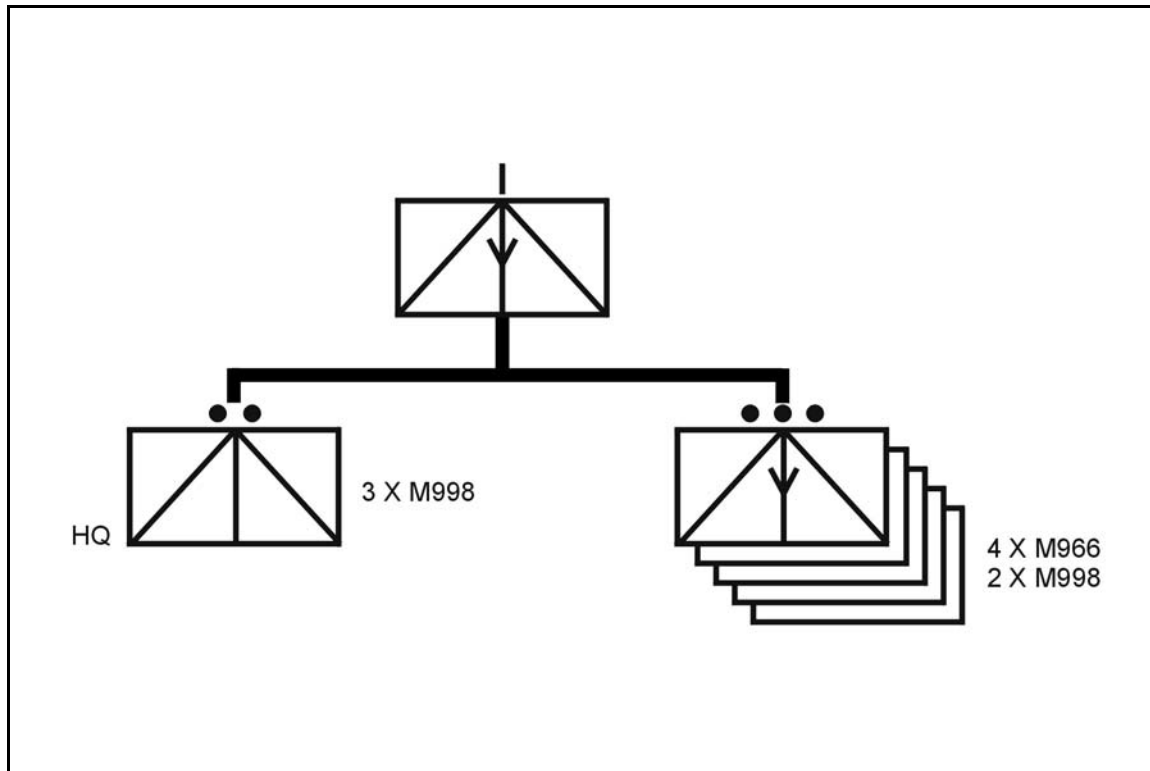


Figure 1-1. Air assault (or airborne) infantry battalion antiarmor company.

b. **Antiarmor Company in the Stryker brigade combat team (SBCT).** Each SBCT has an *assigned antiarmor company* (Figure 1-2). The company commander is responsible for advising the SBCT commander on the tactical employment of the company and its platoons.

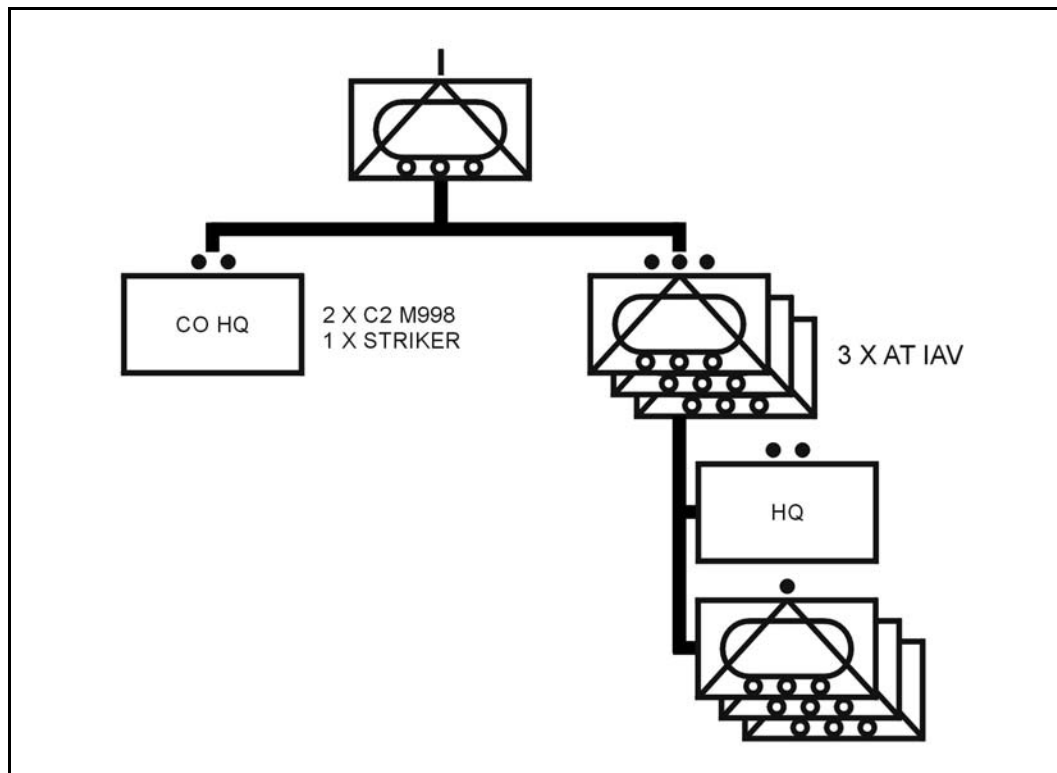


Figure 1-2. Stryker brigade combat team antiarmor company.

c. **Antiarmor Platoon in the Light Infantry Battalion.** In the light infantry division, each infantry battalion has one antiarmor platoon (Figure 1-3, page 1-4). The antiarmor platoon leader is responsible for advising the battalion commander on the tactical employment of the platoon and its sections.

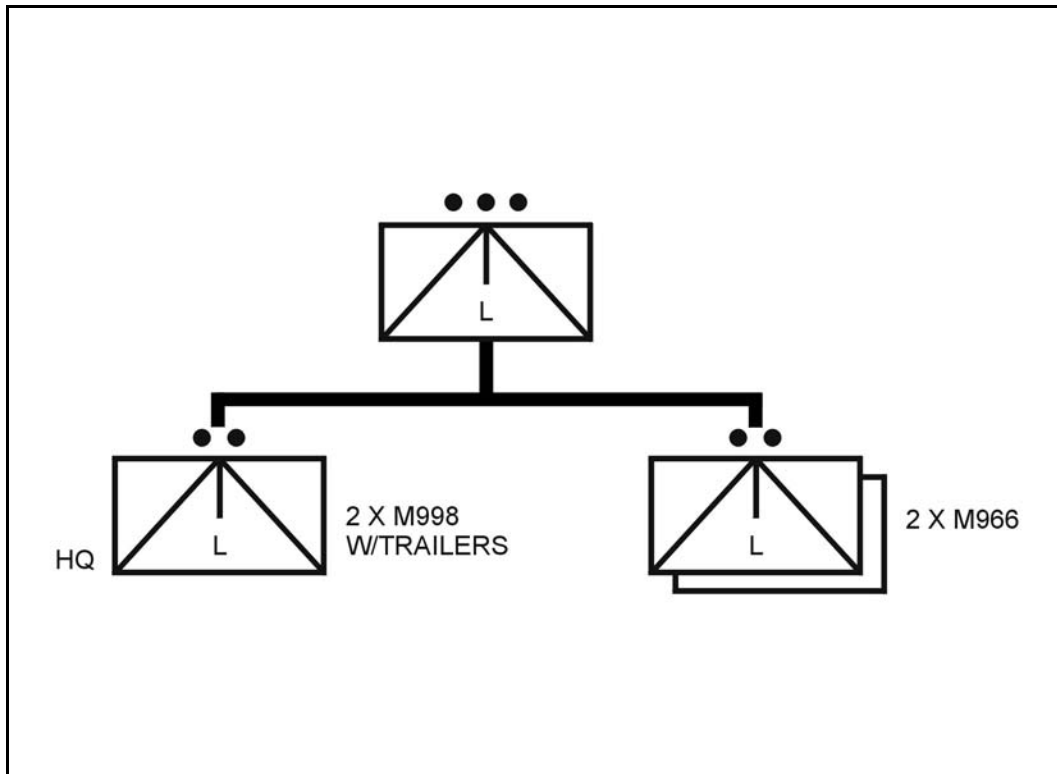


Figure 1-3. Light infantry battalion antiarmor platoon.

1-3. FUNDAMENTALS OF ANTIARMOR UNIT EMPLOYMENT

Following the basic rules of antiarmor employment increases the probability of destroying targets and enhances the survivability of the antiarmor elements.

a. **Mutual Support.** Antiarmor units must support each other due to their assigned tasks, relative positions to each other and to the enemy (obtained via reconnaissance and information sharing), and their inherent capabilities and limitations. To establish mutual support, TOWs are employed in sections with overlapping primary and secondary sectors of fire (Figure 1-4). If one squad is attacked or forced to displace, the other squad continues covering the assigned sector. In order to achieve this effect, the antiarmor squads are positioned so that fires directed at one squad can suppress only that squad. The SBCT antitank platoons' three squads function in the same manner.

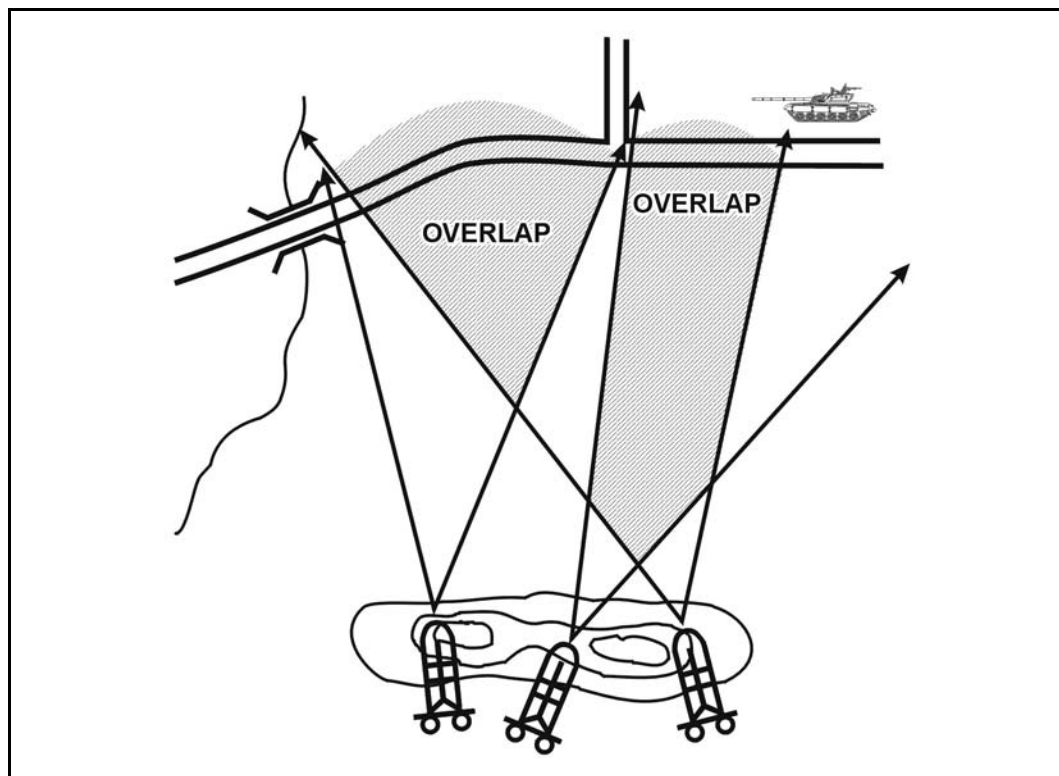


Figure 1-4. Overlapping sectors of fire.

b. **Security.** Antiarmor units must be positioned near friendly infantry units for protection against possible attack by dismounted enemy infantry. Though the infantry units are not required to collocate with antiarmor squads, they should be able to cover dismounted avenues of approach to the antiarmor positions. However, antiarmor units moving with infantry provide their own local security. During halts, the driver or loader dismounts to secure the flank and rear sectors. Overall flank and rear security must be planned at the platoon leader level; if omitted, this lack of protection can be costly. Without flank and rear security during movement, a single enemy vehicle could destroy entire antiarmor squads, sections, or platoons.

c. **Flank Shot Engagements.** Antiarmor squads and sections are positioned to engage tanks or armored vehicles from the flank. Frontal engagements at enemy armor are less desirable for the following reasons:

- (1) An armored vehicle's protection is greatest to the front.
- (2) An armored vehicle's firepower and crew are normally oriented to the front.
- (3) A frontal engagement increases the chance of detection and suppression by enemy armored vehicles.
- (4) An armored vehicle provides a smaller target from the front.

d. **Standoff.** Standoff is the difference between a friendly weapon's maximum range and an enemy weapon's maximum effective range (Figure 1-5, page 1-6). For example, the TOW weapon system's maximum range of 3,750 meters provides it with a standoff advantage over modern, western-built tanks (maximum effective ranges of 2,800 meters) and older, non-modernized tanks (maximum effective ranges of 2,000 meters). Despite this

advantage, engaging enemy armored vehicles within the standoff range (2,000 to 3,750 meters) may not always be tactically feasible. The additional tracking time required to fire a TOW missile beyond 2,000 meters increases the likelihood of gunner error. This possibility gives a frontal target more time to maneuver against the friendly position and provides a flanking target more time to reach cover. Additionally, the terrain may not provide the fields of fire to support standoff distance engagements.

NOTE: The T-55 (modernized), T-64B, T-72S, T-80, T-80U, T-90 main battle tanks, and the BMP-3 can fire anti-tank guided missiles (ATGM) through their main gun tubes up to a range of 4,000 meters, which means the TOW weapon system loses the standoff advantage against them. Some of the tank-launched ATGMs can be fired while the vehicle is on the move. Also, threat armored vehicles can fire high explosive (HE) fragmentation rounds to suppress TOW gunners up to a range of 9,750 meters.

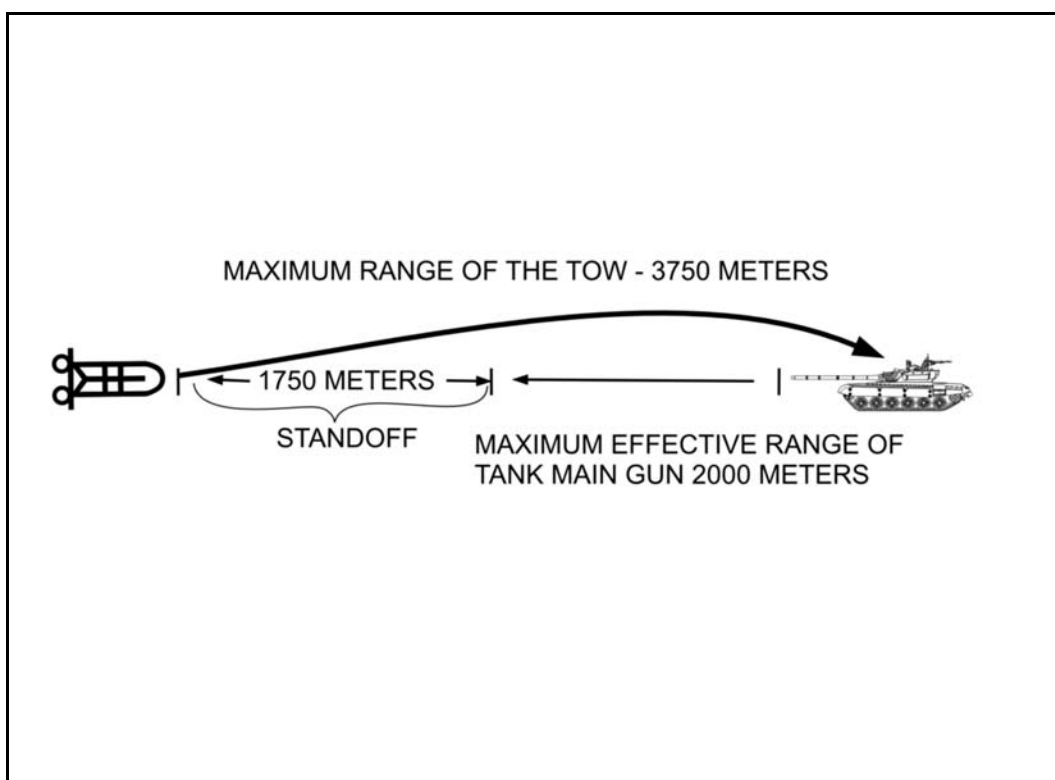


Figure 1-5. Standoff range.

e. Cover and Concealment. Cover and concealment are critical to the survival of antiarmor weapon systems and must be analyzed along with the other factors of METT-TC. An analysis of all of these factors is necessary for the antiarmor unit to be effective, to survive, and to overcome the following inherent weaknesses:

- The gunner is vulnerable because he is exposed while employing the weapon systems (TOW, M2, and MK19).
- The TOW missile and the MK19 40-mm round have a long flight time and a distinctive firing signature.

- The TOW weapon system has a slow rate of fire and requires time to track.

(1) **Cover.** Cover is protection from the effects of enemy direct or indirect fires. It may be natural or made by man. *Natural cover* includes reverse slopes, ravines, and hollows. *Man-made cover* includes fighting positions, walls, rubble, and craters.

(2) **Concealment.** Concealment is the protection from enemy observation. Night vision devices (NVDs) and other detection devices penetrate darkness and prevent it from providing sufficient concealment. Leaders must choose inconspicuous positions and avoid silhouetting the vehicles or weapon systems against the skyline (“skylining”). The principles of concealment include avoiding unnecessary movement, using all available concealment (such as vegetation, rolling terrain, buildings), staying low to observe, exposing nothing that shines, avoiding “skylining,” altering familiar outlines, and keeping quiet.

(a) *Avoid Unnecessary Movement.* Movement attracts attention. A concealed antiarmor position can be detected if the weapon system is traversed or raised, or if any other unnecessary movement occurs. Moving against a stationary background makes the position stand out.

(b) *Use All Available Concealment.* Background is important. To prevent detection, positions must blend with the varied colors and textures of whatever trees, bushes, grass, earth, or man-made structures form the background. (For example, a TOW weapon system stands out if located in an open area, but it is difficult to see in a wooded area.) An antiarmor weapon system should not be fired from the edge of a wood line but rather from a position inside the wood line hidden by the shape and shade of the trees. Leaders must ensure that the concealment does not interfere with the fields of fire of the weapon systems being employed.

(c) *Stay Low to Observe.* The enemy has difficulty seeing a position with a low silhouette. An antiarmor leader should move forward of his position to observe.

(d) *Expose Nothing That Is Reflective.* The reflection of light on a shiny surface attracts attention and can be seen from a great distance. Optics should be used cautiously in bright sunshine due to the reflections they cause. At night, a night vision device can detect light emitted from the instrument panels inside the vehicles.

(e) *Avoid “Skylining.”* Figures and vehicles on the crests of hills can be seen from a great distance, even at night, since dark outlines stand out against lighter sky.

(f) *Alter Familiar Outlines.* Both military equipment and people provide familiar outlines to the enemy. Camouflage changes the familiar outline.

(g) *Keep Quiet.* Noises, such as talking, idling vehicles, or touching metal to metal, can be heard by enemy patrols or listening posts.

(3) **Considerations.** When employing antiarmor weapon systems, leaders should avoid conspicuous terrain, disperse weapons laterally and in depth so that no single enemy weapon can suppress two antiarmor squads, and disperse antiarmor squads to reduce casualties and equipment damage that could result from enemy mortar and artillery fires (Figure 1-6, page 1-8). The considerations for antiarmor weapon system employment also apply during route selection and movement.

(a) *Offensive Considerations.* Determine the routes where cover and concealment are good, identify areas along the approaches to the objective where cover and concealment are poor, and consider using smoke or conducting missions during limited visibility to provide concealment.

(b) *Defensive Considerations.* Focus on locations with good fields of fire. Determine how the enemy can use the available cover and concealment and look at it from his point of

view, both in daylight and at night.

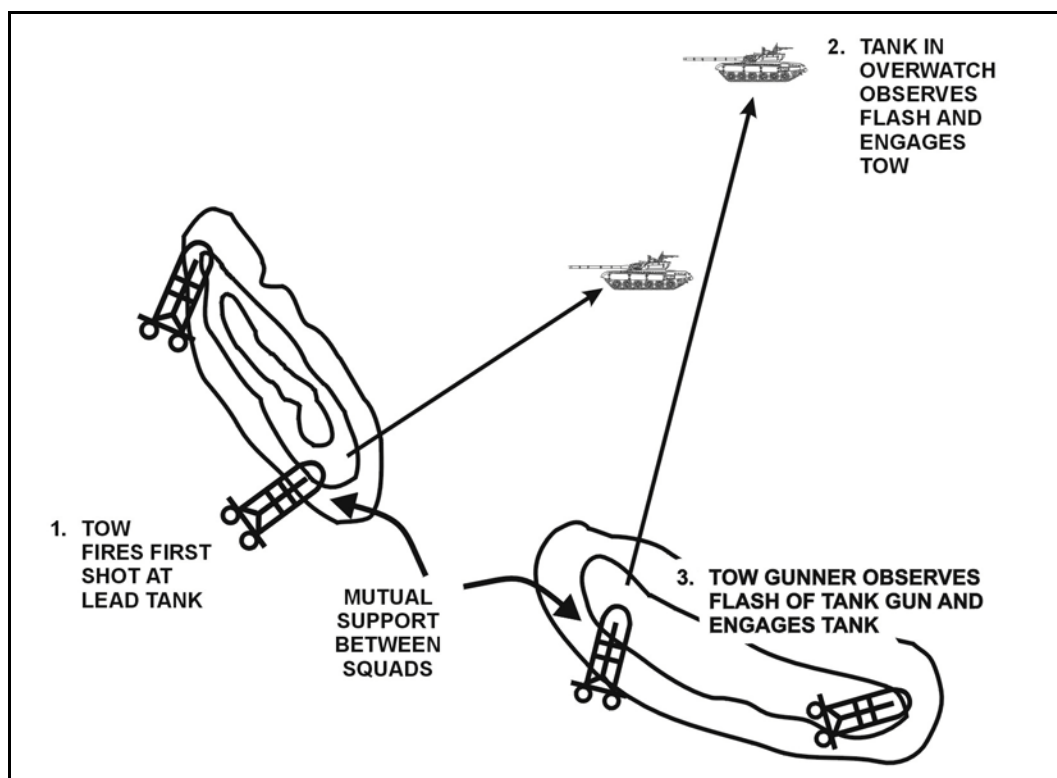


Figure 1-6. Dispersion between squads.

f. **Employment in Depth.** Antiarmor squads should be employed in depth. In the offense, routes and firing positions should be selected to support the forward movement of attacking units. In the defense, antiarmor squads can be positioned forward then moved to positions in depth as the enemy closes, or the squads may be positioned in depth initially.

g. **Employment as Part of a Combined Arms Team.** Skillful integration of infantry, armor, engineer, and indirect fire assets improves the survivability and lethality of antiarmor units.

(1) **Infantry.** Infantry is needed to provide local security and to engage enemy infantry and enemy antiarmor weapon systems. Antiarmor units also support the maneuver of infantry forces.

(2) **Armor.** Antiarmor units support the maneuver of armor forces. Antiarmor units may focus on destroying lightly armored enemy vehicles and dismounted soldiers at long ranges, allowing the tanks to focus on destroying enemy tanks.

(3) **Engineers.** Engineers help shape the battlefield by enhancing mobility, countermobility, and survivability.

(a) Engineers shape the engagement area (EA) for a commander by emplacing tactical obstacles that reduce the enemy's ability to maneuver, mass, or reinforce, and increase his vulnerability to direct and indirect fires. To accomplish this, obstacles must disrupt, fix, turn, or block the enemy. The engineers emplace the obstacles inside designated obstacle zones, belts, and groups. To be effective, the obstacles must be covered by both direct and indirect fire.

(b) Engineers provide expertise and assistance in breaching operations to allow infantry and armor freedom to maneuver.

(c) Engineers provide assistance in the construction of survivability positions. This assistance is especially important when building vehicle (high mobility, multi-purpose wheeled vehicle [HMMWV] or ICV) fighting positions.

(4) **Indirect Fires.** Antiarmor leaders must be part of the indirect fire planning process at higher levels. They must coordinate frequencies, call signs, and priorities of fire. Antiarmor leaders can request indirect fires. To do this, they must contact the battalion mortar platoon, the battalion fire support element (FSE), a fire support team (FIST), or the direct support (DS) artillery battalion. Indirect fires (artillery and mortars) are used to--

- Destroy or neutralize the enemy.
- Slow the enemy rate of advance.
- Destroy or disrupt enemy formations.
- Cause enemy vehicles to button up.
- Suppress accompanying enemy artillery and ATGM support by fire.
- Fire white phosphorous/hexachloroethane (WP/HC) smoke to conceal weapon system firing signatures and to cover the movement of antiarmor squads between positions.

NOTE: When using obscurants in this manner, antiarmor company commanders (or platoon leaders) must consider the degrading effects these obscurants have on their own weapon systems.

1-4. CAPABILITIES AND LIMITATIONS

The antiarmor weapon systems available (TOW, M2, and MK19) provide direct fire against armored or other hard targets to support maneuver of infantry.

a. **Offensive Capabilities.** An antiarmor unit initially provides the base of fire in an attack in order to suppress, fix, or destroy the enemy in position. The antiarmor unit also can be employed in the offense to engage enemy in planned EAs, to isolate objectives by destroying enemy counterattacks, or by destroying withdrawing enemy forces. The antiarmor unit is also well suited to protect flanks, to fix enemy for destruction by infantry or armor companies, or to repel a counterattack.

b. **Defensive Capabilities.** Antiarmor units can be positioned forward of the defensive sector to participate in security operations or to overwatch reconnaissance units or obstacles. As the enemy closes, the antiarmor unit displaces to positions that provide the direct fires into an EA. Antiarmor units often are positioned throughout the depth of the decisive operation's area of operation to cover likely armor avenues of approach. During counterattacks, the antiarmor unit provides overwatching fires for the maneuvering element.

c. **Additional Capabilities.** Depending on the modified table of organization (MTOE), some infantry antiarmor units can use the HMMWV interchangeable mount systems (HIMS). This system enables the unit to adapt quickly to changes resulting from an analysis of the factors of METT-TC. With the HIMS, the unit can quickly mount the MK19 or the M2 on the HMMWV to destroy light armored vehicles, field fortifications, and troops. These weapon systems complement other weapon systems, especially the TOW. The M249, 5.56mm squad automatic weapon (SAW), provides the antiarmor unit with an asset that can

engage targets (dismounted threat) without revealing its M2 or MK19 in the close fight.

d. **Limitations.** Antiarmor units have limitations that apply to both offensive and defensive situations.

(1) Antiarmor units equipped with HMMWVs must consider that these vehicles lack protection against direct and indirect fires. Although ICV-equipped antiarmor vehicles have greater protection against direct and indirect fires than the HMMWV, they are still vulnerable to enemy antiarmor weapons. The SBCT antiarmor company commander must take these vulnerabilities into considerations.

(2) An antiarmor squad (three soldiers) cannot adequately defend itself when confronted with a dismounted threat for an extended period of time.

(3) TOW missiles are accurate, but missile flight time is long (Appendix A). The slow rate of fire and the visible launch signature of the TOW missile increase the antiarmor squad's vulnerability, especially if an HMMWV-mounted TOW engages within an enemy's effective direct-fire range (no standoff). Antiarmor elements can reduce this vulnerability by displacing often and by integrating their fires with those of other weapon systems (M2 and MK19) within the antiarmor unit, with other antiarmor weapons within the battalion (Javelin and AT4), with obstacles, and with indirect fires. Integrated direct and indirect fires, with obstacles, complicate the enemy's target-acquisition process.

(4) Combat service support is limited for units conducting security missions. Additional support should be coordinated with a higher headquarters when an antiarmor unit participates in a security mission.

1-5. ENEMY ANTIARMOR COUNTERMEASURES

Two events have contributed significantly to the worldwide proliferation of antitank, guided missile-countermeasures (ATGM-CM): the end of the Cold War and the dramatic allied success in the Persian Gulf War. The success of ATGMs in the Persian Gulf War has resulted in the design and production of ATGM-CM devices. The ATGM-CM devices available include: use of antiarmor reaction drills, indirect fire, direct fire, reactive armor, camouflage, smoke and obscurants, active protection systems, sensors including laser warning receivers, infrared and laser jammers, and blinders. Although most of the ATGM-CM devices have yet to prove their combat effectiveness, TOW weapon system engagements may become more difficult in the future. Enemy countermeasures to the weapon system include--

- Enemy actions taken before the TOW gunner fires.
- Enemy actions taken while the TOW missile is in flight.
- Enemy actions taken to reduce the effectiveness of the TOW when it hits.

a. **Enemy Actions Taken before the TOW Gunner Fires.** Enemy commanders can counter the effectiveness of the TOW well before exposing their combat formations to its fires. Enemy commanders may conduct aggressive reconnaissance to locate TOW positions and then attempt to destroy them with indirect fires and attack helicopters. Enemy forces are likely to employ deception, camouflage, and heavy use of obscurants to degrade the target acquisition capabilities of the TOW.

(1) **Reconnaissance.** All armies reconnoiter continuously to locate and to target antiarmor systems. To protect friendly units from ground reconnaissance elements, US forces employ security operation forces, which must use all available concealment to augment information sharing (digital and nondigital). US forces also use dummy and hide

positions to help give the enemy a false picture of the US defense.

(2) **Deception.** Deception is part of the doctrine of all modern armies. It includes using camouflage to disguise, conceal, or distort; using darkness, weather, and obscurants to mask operations; using decoy equipment; masking light and sound; conducting diversionary actions or demonstrations; and practicing communications security.

(a) *Camouflage.* Many armored vehicles are now equipped with various methods to reduce their signatures and conceal their presence, to include--

- Camouflage paint.
- Camouflage nets to provide concealment from both optics and radar.
- Low silhouette profiles.
- Less dependence on active infrared (IR) during limited visibility.

(b) *Smoke and Obscurants.* Enemy forces may employ obscurants to mask movement from identified or templated TOW positions. Natural dust and obscurants restrict the capability of thermal sights and TOW guidance mechanisms. Obscurant-filled projectiles are typically used to lay blinding smoke on TOW positions. Improved obscurants can degrade thermal sights. Dust kicked up by high explosive projectiles, mortar, artillery, rocket, and tracked vehicle movement is an effective screening agent that blocks out thermal, laser, and direct view optics.

(c) *Decoys.* Many countries have developed full-sized tank decoys that confuse TOW gunners. Heat sources can be used to defeat, degrade, or confuse TOW guidance systems.

(d) *Artillery and Mortars.* The enemy tries to suppress or destroy TOW weapon systems by either observed or unobserved fires on known or likely positions. Some armies have 122-mm and 152-mm howitzers to fire flechette rounds that are effective against unprotected soldiers and equipment. These rounds have a maximum range of 15,300 to 17,000 meters. Each round explodes above the ground and scatters about 8,500 small, finned flechettes over an area about 30 meters in diameter.

(e) *Attack Helicopters.* The enemy may follow the previously described preparatory fire with attack helicopters. Enemy attack helicopter pilots follow concealed routes that allow them to approach the flank or rear of each antiarmor unit undetected.

b. **Enemy Actions Taken While the TOW Missile is in Flight.** Enemy armor units are trained and equipped to counter TOW fires. This training includes terrain driving, suppressing or destroying TOWs with direct fire, use of on-board obscurants, and active protection systems.

(1) **Terrain Driving.** Enemy forces make use of contours in the terrain (dead space) to reduce their exposure to TOWs. Antiarmor units must account for dead space by emplacing obstacles, by observation, and by the employment of other weapon systems (MK19, M203, and mortar or artillery fires).

(2) **Suppressing or Destroying ATGMs with Direct Fire.** The TOW missile's launch signature gives away its position, and armored crews are trained to engage these systems upon detection. Many enemy vehicles are armed with weapons and munitions that can suppress or destroy TOW positions.

(a) *Tanks.* Several Russian-produced tanks (T-55 AM modernized, T-64B, T-80, T-80U, and T-90) and the Boyevaya Mashina Pekhoty (BMP-3, Russian combat vehicle, infantry) can fire ATGM (AT-8, AT-10, AT-11). These missile-firing tanks can be used to destroy our antiarmor systems. However, *all* tanks can fire high explosive fragmentation (HE-FRAG) rounds at ranges beyond 4,000 meters. The 125-mm time-and-percussion-fused HE-FRAG

round can be programmed to explode over a defensive position out to 5,000 meters or can be contact-detonated out to 9,700 meters to suppress or destroy antitank weapons. The use of hide positions before the enemy comes within range of the TOW limits the effectiveness of long-range, HE-FRAG munitions.

(b) *Light Armored Vehicles*. Light armored vehicles include reconnaissance vehicles, infantry fighting vehicles, and armored personnel carriers. These vehicles usually are armed with an automatic cannon, gun and or machine guns, and sometimes an ATGM with a 4,000- to 5,500-meter range. Many foreign ATGMs have thermal capability and other improvements, including faster missiles and blast warheads, for use against defensive positions. The BMP-3 100-mm HE-FRAG round can destroy TOW positions from 4,000 meters away. The weapons systems on these vehicles present a threat to TOW launchers. Antiarmor units protect themselves from direct fire through effective camouflage, use of available concealment, and by fighting from prepared fighting positions when possible. Movement to alternate firing positions after initial engagement limits enemy target acquisition capabilities. Antiarmor units may also opt to engage light armored vehicles with M2 or MK19 and mortar and or artillery fires to preserve the TOW weapon system for employment against other enemy armored vehicles.

(3) **On-board Obscurants**. On-board obscurants that quickly screen the vehicle include the smoke grenade launcher and the vehicle exhaust smoke system.

(a) *Smoke Grenade Launchers*. To counter the TOW threat, many countries have equipped their combat vehicles with smoke grenade launchers. Smoke grenade launchers provide a rapid means of screening the vehicle. Obscurants launched from these grenade launchers can block the view of the target or interfere with the TOW's guidance system. Grenades available for some of these systems include smoke, antipersonnel, flare, tear gas, and IR decoy. Improved obscurants can degrade thermal sights and ATGM guidance systems. The grenade launchers are activated from inside the vehicle.

(b) *Vehicle Engine Exhaust Smoke System (VEESS)*. The VEES, or similar system, sprays diesel fuel into the exhaust manifold. This system produces obscurants to protect the unit's movement. Obscurants from these systems interfere with direct view optics, image intensifier (I2 or starlight) sights, TOW guidance systems, and lasers. While thermal sights enable the gunner to see through some smoke, the gunner may not be able to maintain control of the missile through the smoke. The gunner may lose the missile unless he is using a TOW 2 family of missiles, a modified missile guidance system, and the thermal sight. In addition to using the TOW 2 capabilities, the dispersal of antiarmor squads around planned engagement areas limits the effectiveness of the enemy's on-board obscurants.

(4) **Active Protection Systems**. Active protection systems electronically sense incoming direct-fire ATGMs and high explosive, antitank (HEAT) munitions, and they defeat the incoming munitions before they impact the vehicle. Soft-kill active protection systems cause the munitions to miss. Hard-kill active protection measures fire munitions at the incoming round to destroy, neutralize, or detonate it.

(a) *Laser Warning Receivers*. Many armored vehicles are equipped with laser-warning receivers that alert the crew when their vehicle has been lased by a laser range finder. By using the laser-warning receiver, the crew identifies the type of laser range finder or designator and the direction of the laser. The crew then can take evasive action by either firing its weapons at the laser or by launching smoke. Some tanks have their laser warning receivers linked to the smoke grenade launchers, causing smoke to be employed

automatically when lased. To counter this capability, the antiarmor squad limits the use of laser range finders. When laser range finders are used, they select an object at least three-vehicle lengths away from the target. Another potential action is to use the laser against suspected enemy positions to trigger their laser-warning receiver. This action causes the vehicle to launch smoke grenades, which confirms its presence.

(b) *ATGM Jammers*. The ATGM infrared jammers use an infrared signal to jam and then confuse ATGM guidance in flight with erroneous signals, causing the ATGM to miss the target. Counter-countermeasures include use of the TOW 2 family with modified missile guidance systems and thermal sight, or detecting the ATGM jammer with thermal or image intensifier (for example, PVS-7B) before launch and choosing a different attack method.

(c) *Hard-Kill Systems*. There are several hard-kill active protection systems such as the “Drozd” and the “Arena.” These systems have mounted counter munitions that are fired at incoming munitions when detected by the system’s radar. These systems do not protect the vehicle from all directions. The TOW gunners engage targets in vulnerable areas when possible. Use of mortars and artillery may destroy externally mounted sensors and countermeasure dispensers.

c. **Enemy Actions Taken to Reduce the Effectiveness of the TOW When It Hits.** The most effective enemy countermeasure in this category is the use of reactive armor. Reactive armor contains explosives sandwiched between metal plates. The explosive detonates and jettisons the outer metal upon contact with shaped-charge munitions. The rapid motion of the outer metal plate disrupts the shaped-charge, reducing penetration. Newer reactive armor can be developed to counter the ATGMs that were developed to defeat first-generation reactive armor with either tip charges (TOW 2A) or a top attack (TOW 2B).